

SUPPORTING STATISTICS TEACHERS

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Statistics teachers in schools must be amongst the most isolated of teachers. They very rarely work alongside other teachers of statistics and consequently are very prone to feelings of loneliness and low morale. They often have nobody with whom to share ideas, to praise their efforts in championing the subject or even to complain to. This cannot be a very healthy situation for the development of statistical education in schools and everything possible needs to be done to alleviate the situation if we are going to see improvements in the teaching of statistics. This paper looks at some of the ways in which the problem is being tackled by the RSS, the ASA, ICOTS, IASE and others.

Do you work with other statisticians? Do you work in a statistics department? If you do, can you imagine what it would be like never to get the chance to talk to another statistician, to work in isolation with no support or encouragement? This is how many, perhaps most, statistics teachers work and despite these conditions still do an excellent job.

In our universities and colleges we are much more likely to be part of a group of statisticians even if it is not a whole department, but even here there are many lecturers who work in other subject areas such as Business Studies, Urban Studies, Chemistry, Engineering, etc. and so have only limited contact with other statisticians. In schools the situation is far worse. Early research (The Schools Council, 1981) showed that in most schools in the UK there is no teacher with any formal qualification in statistics and the chance of there being more than one such is very remote. To the best of my knowledge this situation has improved only marginally in recent years and is mirrored around the world. Those teachers who do find themselves teaching statistics are inevitably isolated and lack support. This is a cause for great concern for those of us who wish to promote the teaching of statistics, because working alone in this way can be extremely difficult and it is all too easy to become demoralised and out-of-date. There is no encouragement to develop and improve.

Fortunately there are ways in which some support can be given to those who need it. A great deal is beginning to happen around the world to help statistics teachers and this paper attempts to outline some of these initiatives in the hope that these ideas will be taken up by your own statistics communities. As teachers we are renowned for being able

to take ideas and develop them to suit our own situations, I hope you will learn of some things here which you will be able to adapt to support your own statistics teachers.

One of the most valuable ways in which we can support statistics teachers is by putting them in touch with other statistics teachers. Most people would agree that the optimal form this will take will be through face-to-face meetings such as this conference and similar gatherings organised by the International Association for Statistical Education (IASE), the Royal Statistical Society (RSS) in the UK, the American Statistical Association (ASA), the Association of Statistics Lecturers in Universities (ASLU) again in the UK and like organisations across the world. These conferences are aimed primarily at broadcasting research but at the same time they do allow individuals to share much more personal experiences of teaching which can be equally valuable, particularly to those who work alone. International conferences and seminars such as these are excellent for those able to attend but unfortunately, despite the best efforts of the organisers, these include very few school teachers. For these teachers, attendance is often out of the question, if only for financial reasons. There is a need then for more local meetings, perhaps lasting only one day or a part of one day. In the UK the RSS has organised many such workshops, meetings and day conferences across the country. The format of these varies considerably but one benefit arises in every case, teachers meet other teachers as well as the speakers and organisers. Such meetings take place in most other countries to a greater or lesser degree and we should be encouraging and supporting them whatever their format

Whilst face-to-face meetings may be desirable they are still not attainable for many teachers due to constraints of finance, time and distance, so what more can be done? Perhaps the next best thing is written communication via newsletters, journals and electronic bulletin boards. The production of journals such as *Teaching Statistics* and newsletters such as that published by the Statistics Teacher Network mean that fresh ideas can be disseminated and events advertised. As an added bonus they can sometimes lead to individual correspondence between readers and authors. Electronic bulletin boards and journals work in much the same way, except that in many cases they also encourage individuals to contribute to the general debate as well as communicating directly with the author. Once again they can lead to personal contacts and ongoing support. In the United States there is even an electronic forum, ISOSTAT, which is specifically aimed at “isolated statistics teachers”. Interestingly this has led to the formation of local groups

who also meet face-to-face once a year. Currently access to the necessary technology and the support to be able to use such communication systems is unevenly and uncertainly distributed around the globe but it is hoped that the spread of the necessary technology will greatly reduce the “distance” between teachers. All of these modes of communication are international, meaning that readers gain an international perspective and have access to a wider range of ideas. In addition they are available (technology permitting) around the world including, for example, developing countries which cannot afford to resource their own national initiatives.

Other more unusual methods of bringing teachers together are worth noting. One fairly recent phenomenon that has spread around the world is the idea of a Statistics Competition where pupils carry out and submit statistical projects in the hope of being awarded a prize. Although such a competition is for pupils it does draw their teachers into the statistics community. In the same way workshops for pupils such as those organised by the RSS Education Committee also involve the teachers and provide a platform for promoting other events aimed directly at teachers.

The RSS has also introduced a new concept, Associate Schools. For a small fee a school can become an associate member of the RSS and hence entitled to the monthly newsletter, reduced rates for staff at conferences and workshops and access to specially designed teaching materials. In addition to the obvious benefits this means that teachers have a line of communication to a pool of experts and practitioners who are willing to give talks to both them and their pupils, at the same time as being kept up-to-date in the academic field. It is hoped that eventually, with the support of RSS local groups, associate schools in neighbouring areas will be able to come together to form their own network groups with meetings which they themselves arrange. This initiative is a recent one and it is too early to know whether it will be successful, but if it does it will be a great stride forward. It seems that teachers do need a focal point for initiating contact with other statistics teachers. In the UK we are fortunate to have a Centre for Statistical Education sponsored by the RSS, the University of Nottingham and SPSS(UK). The Centre staff are able to support individual teachers through their own expertise and their Resources Centre, as well as promoting statistical education through research projects, conferences and courses.

Another point of contact may be a training course in statistics or statistics teaching. Although the primary aim of such courses is to train teachers in statistics itself

or the ways in which it can be taught, we should not underestimate the added bonus of putting teachers in touch with other teachers who have a similar interest in the subject. A prime example of this would be the Quantitative Literacy Project in the United States which runs workshops on statistics across the country. I wonder how many of the teachers involved keep in touch with others they met first at one of these workshops?

Other such courses, at varying levels, are taking place around the globe but the dispersion of statistics teachers means that often a traditional course is not practical. One way of overcoming this is by the use of distance education. Currently I know of two such courses specifically for statistics teachers, one at the University of Tasmania and the other at my own institution, Sheffield Hallam University. In both cases students are learning both about statistics itself and about the teaching of it. Perhaps just as importantly they are meeting other teachers of statistics, both the other students and the lecturers who teach *them* statistics. Of course, being distance learning courses, face-to-face contact is minimal, but residential schools are excellent places for making contact and it is also possible to include telephone and video conferencing. I know from experience on the study schools for the course that I run (the MSc in Applied Statistics with Statistical Education) that some of the most interesting conversations about the teaching of statistics take place during the coffee breaks or over the study school dinner! I also try to arrange that my own study school sessions involve group work and discussion so that the students have the opportunity to share experiences. Students once they have met do tend to keep in touch with each other, even after they have finished the course. They are also encouraged to keep in contact with the course team so that we can pass on information about what is happening in the world of statistics education. So, for both past and present students, we can be a dissemination point for new developments.

We are fortunate in the UK to have the support of the RSS who do so much for our statistics teachers, through their own education committee, the Centre for Statistical Education, the Associate Schools Scheme and the provision of bursaries for teachers wishing to enrol on courses to improve their statistics teaching. Teachers in the United States gain similar support from the ASA, and professional organisations in many other parts of the world do likewise. The commitment of these statisticians to education is admirable and we should do our utmost to support their efforts.

This paper, whilst being in no way comprehensive, has attempted to outline some of the ways in which statistics teachers can be helped and supported but despite all this

there are still many teachers of statistics who simply do not know that all this help is available and they present the greatest challenge of all. We need to reach out to them using every possible channel of communication. It is not enough to broadcast information in, for example, newsletters for statistics teachers. We need to go beyond the boundaries of our own subject areas and use newsletters, bulletin boards, journals etc. which are aimed at mathematicians in particular, but also teachers of geography, business studies, science and many more subjects which use statistics. All of this requires a lot of time, money and effort but it needs to be done if statistical education in schools is to develop. Statistical organisations such as RSS and the ASA can provide a focus for these initiatives but there is also a need for commitment from individuals. We all need to ask ourselves what we can do to help those teachers working alone in schools so that together we can improve the statistical education of the next generation.

REFERENCES

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